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(54) Respiratory protector

In a respiratory protector, as required, for example, in firefighting, and in which the user must wear a breathing mask, it is prescribed that a compressed air breathing apparatus and a filter breathing apparatus be connectable to a common mask element in combination, during which switching to the compressed air breathing apparatus or filter apparatus can occur alternately in order to be able to spare the breathing air process of the compressed air breathing apparatus as much as possible when necessary.

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Respiratory Protector

Patent Claims

1. Respiratory protector with a mask element, characterized by the combination of a compressed air breathing apparatus with a filter breathing apparatus that are connectable to the common mask element.
2. Respiratory protector according to Claim 1, characterized by a switching device, through which the compressed air breathing apparatus or the breathing filter can be connected alternately to the mask element.
3. Respiratory protector according to Claim 1 or 2, characterized by the fact that in a compressed air breathing apparatus with a supply vessel for breathing air under pressure, as well as a regulator and a demand valve connected to it, a switching valve is connected in the connection line leading from the demand valve to the mask element, via which this line can be alternately connected to the compressed air breathing apparatus or to a breathing filter.
4. Respiratory protector according to Claim 1, 2 or 3 characterized by the fact that the switching valve is controllable by hand.
5. Respiratory protector according to Claim 1, 2 or 3 characterized by a control device for the respiratory protector that automatically carries out control of the valve as a function of certain stipulated values of the surrounding air.

Description

The invention concerns a respiratory protector and especially a small easily-wearable device, as required, for example, by persons engaged in firefighting.

Apparatuses, some of which provide breathing air by cleaning the surrounding air from respiratory toxins, while others are used when it is foreseen that no more breathable air can be obtained by purification and they supply breathing air from breathing air reservoirs are used by fire departments and similar emergency services during firefighting and other emergency operations during fires and the like.

The latter include the so-called compressed air breathing apparatuses, which have one or more containers for compressed air, from which the breathing air is fed to a mask element via a regulator and a demand valve. During use, such apparatuses must be set up outside of the threatened area, i.e., at a location in which the surrounding air can still be breathed by persons without an adverse effect. This means that breathing air is required not only for direct use on location, but also for the back and forth trip. If a long use time is required, large breathing air vessels are required, which are heavy. This is at variance with the requirement that such apparatuses should be small and light so as not to unduly hamper the wearer at the use location during his activity.

If one imagines that the size of the breathing air container and therefore the weight of the apparatus is determined to a significant degree by the amount of breathing air required by the wearer of the apparatus during back and forth movement to the actual use location and from the hazardous area, considerable container volume and weight can be saved, if the wearer of the apparatus is provided with breathing air at least during part of the back and forth trip without requiring an air supply in the supply vessel.

The underlying task of the invention is therefore to devise an apparatus that permits conserving of the breathing air supply in the compressed air vessel during back and forth movement even when the device is being worn and therefore permits a small and light design of such an apparatus.

This task is solved according to the invention in a respiratory protector of the type just mentioned with a mask element to be worn by the wearer, primarily in that a

compressed air breathing apparatus of the mentioned type is combined with a filter breathing apparatus so that both can be connected to a common mask element. A switching device is to be provided through which the compressed air breathing apparatus or the filter apparatus or breathing filter can be connected alternately to the mask element. In an apparatus for the compressed air breathing apparatus having a supply vessel for breathing air under pressure, as well as a regulator and a demand valve connected to it, a switching valve can be connected in the connection line leading from the demand valve to the mask element, through which this line can be connected in alternation to the compressed air part of the compressed air breathing apparatus or to a breathing filter. This switching valve in the simplest case can be controlled by hand. However, a control device can also be provided for the valve that automatically controls it as a function of the stipulated values of the surrounding air.

The invention permits a number of variants. One variant of a respiratory protector according to the invention is shown in the drawing with the essential parts for understanding.

The depicted apparatus starts from a compressed air breathing apparatus of the usual type, which has a compressed air container 11 for the breathing air, to whose check valve 12 a regulator 13 is connected, which in turn is connected via a line 14 to a demand valve 15. All parts are grouped tightly around the check valve 12 so that a compact apparatus is produced which can be conveniently put on by the user by means of support belts 16 and holding belts 17, which engage on a support plate 18.

A valve 19 switchable by a handle 191 is connected to the demand valve 15, through which the hose line 20 leading to the mask element (not shown) can be connected alternately to the demand valve 15 or to the breathing filter 21. In this manner it is possible to use the apparatus after it is put on and the mask element is in place only with the breathing filter 21 initially, until the surrounding air is so strongly toxic that filtering out of the toxic components is no longer sufficiently possible. Only then is it necessary to switch to compressed air operation by turning handle 191. On leaving the hazardous area, the corresponding operation in reverse sequence is possible, when a switch can be made to filter operation to save compressed air as soon as the surrounding air permits it.

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